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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,874	10/31/2001	Edward B. Gindele	83336RLO	7299

7590 09/08/2004

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EXAMINER	
TUCKER, WESLEY J	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 09/08/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/998,874	GINDELE ET AL.	
	Examiner	Art Unit	
	Wes Tucker	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9-12,14,15 and 18-20* is/are rejected.

7)☒ Claim(s) *7,8,13,16 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 4, 6, 9, 10, 12, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,594,816 to Kaplan et al.

With regard to claim 1, Kaplan discloses a method of spatially filtering a digital image comprising the steps of:

a) receiving a source digital image including pixels corresponding to one or more different colors (column 2, lines 21-24);

b) selecting a pixel of interest in the source digital image (column 2, lines 25-30);

c) calculating two or more noise free pixel estimates for the pixel of interest using pixel values sampled in a local region about the pixel of interest (column 2, lines 42-47);

d) selecting a final noise free pixel estimate for the pixel of interest by finding the noise free pixel estimate closest in value to the value of the pixel of interest (column 2, lines 42-47); and

e) repeating steps b) through e) for other pixels in the source digital image to provide a spatially filtered digital image (column 2, lines 25-30).

Kaplan discloses a moving window that eventually uses every pixel in the image as the target pixel or pixel of interest. With regard to step c) the least squares estimates are considered the noise free pixel estimates. With regard to step d) the noise-reduced code value is interpreted as the noise free estimate that is closest in value to the pixel of interest because of the method used in calculating the least squares regression determines "goodness of fit."

With regard to claim 2, Kaplan discloses the method of claim 1, wherein step c) each noise free pixel estimate is independent from the value of the pixel of interest (column 2, lines 32-40). Here Kaplan discloses that the pixels in the neighborhood are used for the target pixel estimate.

With regard to claim 3, Kaplan discloses the method of claim 2 wherein step d) further includes subtracting the final noise free pixel estimate from the value of the pixel of interest to form a residual pixel value (column 2, lines 43-48); and further including f) using the residual pixel values to estimate a noise characteristic value relating to the noise content of the source digital image (column 2, lines 54-60). The noise reduced code value is interpreted as being used to subtract the noise from the target pixel. The noise characteristic value is interpreted as the goodness of fit, which is determined by a least squares regression which uses the weight values or noise determining values.

With regard to claim 4, the discussion of claim 1 applies to steps a) through d) and f). With regard to step e) the discussion of claim 3 applies.

With regard to claim 6, Kaplan discloses the method of claim 4 where one of the noise free pixel estimates is calculated as a linear combination of the values of pixels sampled about the pixel of interest along a line centered in the local region about the pixel of interest (Fig.2). Here Kaplan displays where pixels are in a line about the target pixel.

With regard to claim 9, the discussions of claims 1, 3, and 4 apply to steps a) through f). With regard to step g) Kaplan discloses using residual pixel values to calculate a noise characteristic (column 2, lines 55-60). Here the noise characteristic is interpreted as the goodness of fit, which is found in the process of determining the noise-reduced code pixel value or residual pixel value.

With regard to claim 10, Kaplan discloses the method of claim 9, wherein step g) includes calculating the noise characteristic value as a function of the numerical values of the source digital image pixels (column 2, lines 32-36).

With regard to claim 12, Kaplan discloses the method of claim 9, wherein step g) includes calculating the noise characteristic value as a function of the standard deviation of the noise residual pixel values (column 2, lines 35-42).

With regard to claim 14, Kaplan discloses the method of claim 9 wherein step d) further includes selecting the final noise free pixel estimate for the pixel of interest by finding the noise free pixel estimate closest in value to the value of the pixel of interest (column 2, lines 43-48). The noise-reduced code value is interpreted as the noise free estimate closest to the pixel of interest because of the goodness of fit operation performed (column 2, lines 54-60).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 9-12, 14, 15 and 18-20 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,718,068 to Gindele.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

With regard to claim 1, Gindele discloses a method of spatially filtering a digital image comprising the steps of:

a) receiving a source digital image including pixels corresponding to one or more different colors (Fig.4);

b) selecting a pixel of interest in the source digital image (column 4, lines 5-7);

c) calculating two or more noise free pixel estimates for the pixel of interest using pixel values sampled in a local region about the pixel of interest (column 4, lines 6-8);

d) selecting a final noise free pixel estimate for the pixel of interest by finding the noise free pixel estimate closest in value to the value of the pixel of interest (column 4, lines 8-14); and

e) repeating steps b) through e) for other pixels in the source digital image to provide a spatially filtered digital image (column 6, lines 9-20). It is understood that the process is repeated for all the pixels in the image. As for step d), Gindele discloses statistic weighting factors to match the noise free pixel estimate and is considered equivalent to finding the noise free pixel estimate closest in value of the pixel of interest.

With regard to claim 2, Gindele discloses the method of claim 1 wherein step c) each noise free pixel estimate is independent from the value of the pixel of interest (column 4, lines 8-14). Here Gindele discloses that the calculation of the statistical

weighting factor is independent of the noise free pixel estimate and this is interpreted as being independent of the value of the pixel of interest.

With regard to claim 3, Gindele discloses the method of claim 2 wherein step d) further includes subtracting the final noise free pixel estimate from the value of the pixel of interest to form a residual pixel value; and further including f) using the residual pixel values to estimate a noise characteristic value relating to the noise content of the source digital image (column 6, lines 42-54). Here the noise characteristic value is interpreted as the value of noise that is filtered out of the image and that filtered noise value is determined as a function of the source pixels in the initial noise free pixel estimate (column 4, lines 8-14). That noise would be a representation of a characteristic value for noise in the rest of the source image.

With regard to claim 4, Gindele discloses a method of calculating a noise residual digital image from a source digital image, comprising the steps of:

a) receiving a source digital image including pixels corresponding to one or more different colors (Fig.4);

b) selecting a pixel of interest in the source digital image (column 4, lines 5-7);

c) calculating two or more noise free pixel estimates for the pixel of interest using pixel values sampled in a local region about the pixel of interest (column 4, lines 6-8);

d) selecting a final noise free pixel estimate for the pixel of interest by finding the noise free pixel estimate closest in value to the value of the pixel of interest (column 4, lines 8-14); and

e) calculating a noise residual pixel value by calculating the difference between the value of the pixel of interest and the value of the final noise free pixel estimate (column 6, lines 42-55); and

f) repeating steps b) through e) for other pixels in the source digital image to produce a noise residual digital image (column 6, lines 53-55).

With regard to step e) it is interpretted that a noise residual pixel value be calculated by calculating the difference between the value of the pixel of interest and the value of the final noise free pixel estimate because as the noise reduced pixel digital image is formed the difference between the value of the pixel of interest and the final value of the noise removed pixel of interest would be the left over noise residual pixel value. So the difference between the noisy and noise removed image is considered the noise residual.

With regard to claim 5, Gindele discloses the method of claim 4 wherein step c) each noise free pixel estimate is independent from the value of the pixel of interest (column 4, lines 3-14).

With regard to claim 6, Gindele discloses the method of claim 4 where one of the noise free pixel estimates is calculated as a linear combination of the values of pixels

sampled about the pixel of interest along a line centered in the local region about the pixel of interest (Fig.1).

With regard to claim 9, Gindele discloses a method of calculating a noise characteristic value from a source digital image, comprising the steps of:

a) receiving a source digital image including pixels corresponding to one or more different colors (Fig.4);

b) selecting a pixel of interest in the source digital image (column 4, lines 5-7);

c) calculating two or more noise free pixel estimates for the pixel of interest using pixel values sampled in a local region about the pixel of interest (column 4, lines 6-8);

d) selecting a final noise free pixel estimate for the pixel of interest by finding the noise free pixel estimate closest in value to the value of the pixel of interest (column 4, lines 8-14); and

e) calculating a noise residual pixel value by calculating the difference between the value of the pixel of interest and the value of the final noise free pixel estimate (column 6, lines 42-55); and

f) repeating steps b) through e) for other pixels in the source digital image thereby forming a residual digital image from the noise residual pixel values (column 6, lines 53-55); and

g) using the noise residual pixel values to calculate a noise characteristic value (column 6, lines 42-54).

When the pixel of interest is filtered it is considered to then be a noise removed residual pixel value and the noise characteristic value is interpreted as the noise value that is filtered out of the pixel of interest.

With regard to claim 10, Gindele discloses the method of claim 9 wherein step g) includes calculating the noise characteristic value as a function of the numerical values of the source digital image pixels (column 6, lines 42-54). Here the noise characteristic value is interpreted as the value of noise that is filtered out of the image and that filtered noise value is determined as a function of the source pixels in the initial noise free pixel estimate (column 4, lines 8-14).

With regard to claim 11, Gindele discloses the method of claim 9 wherein step g) includes calculating the noise characteristic value as a function of color and the numerical values of the source digital image pixels (column 6, lines 42-54). Here the characteristic value is considered to be a function of color as the noise estimation is performed for a color image and inherently uses color/pixel values.

With regard to claim 12, Gindele discloses the method of claim 9 wherein step g) includes calculating the noise characteristic value as a function of the standard deviation of the noise residual pixel values (column 8, lines 20-26).

With regard to claim 15, Gindele discloses the method of claim 9 where one of the noise free pixel about the pixel of interest along line centered in the local region about the pixel of interest (Fig.4).

With regard to claim 18, Gindele discloses A method of enhancing a digital image comprising the steps of:

h) using the method of claim 9 to calculate a noise characteristic value (column 6, lines 42-54).

i) using the noise characteristic value and the source digital image to generate an enhanced digital image (column 4, lines 8-14).

Here the noise characteristic value is interpreted as the value of noise that is filtered out of the image and that filtered noise value is determined as a function of the source pixels in the initial noise free pixel estimate (column 4, lines 8-14).

With regard to claim 19, Gindele discloses the method of claim 18 wherein step 1) further includes using the noise characteristic value to remove noise from the source digital image to produce the enhanced digital image (column 4, lines 8-14). Here the noise characteristic value is interpreted as the noise value that if filtered out of the image and removing it creates and enhanced image.

With regard to claim 20, Gindele discloses the method of claim 18 wherein step 1) further includes using the noise characteristic value to sharpen the source digital

image to produce the enhanced digital image (column 4, lines 8-14). Here the noise characteristic value is interpreted as the noise value that if filtered out of the image and removing it creates and enhanced image and removing noise typically sharpens the image.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 4, 9, and 12 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2 and 5 of U.S. Patent No. 6,718,068 to Gindele. Although the conflicting claims are not identical, they are not patentably distinct from each other because the current claims cover the same subject matter as the patent claims, but are merely broader recitations of the invention.

Allowable Subject Matter

Claims 7, 8, 13, 16, and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 703-305-6700. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wes Tucker

8-27-04

Jon Chang
Primary Examiner